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AUTHOR Van Mondfrans, Adrian P.; And Others
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ABSTRACT

A study of whether the effects of block scheduling on student achievement and attitudes are more advantageous than traditional scheduling was made. The block scheduling treatment invclved three required courses on each of four grade levels--freshmen through senior in high school. Interdisciplinary teaching teams were responsible for instruction. The traditional scheduling treatment involved each teacher with three classes of 30-35 students for 40 minutes each day. The basic schedule design involved three teachers, 19-110 students for each grade and subject over a period of 140 minutes. Each team of three teachers met with two groups of students, a morning and an afternoon session. Data for analysis included the scores on objective, teacher-made tests covering the material taught in the instructional units and the ratings filled out by students on their interest and attitudes toward learning. An analysis of variance was performed. Since only two of 30 possible F-ratios were significant when the attitude and interest scores were analyzed it was concluded that the two treatments did not differentially affect these variables. The findings of this study suggest several questions concerning the effectiveness of block scheduling. These relate to teacher difficulty in handling the flexibility in time and group size, the importance of time and group size flexibility, and the need for maturity on the part of the learner. (CK)

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COMPARING BLOCK SCHEDULING AND TRADITIONAL SCHEDULING ON STUDENT ACHIEVEMENT AND ATTITUDES[1]

ADRIAN P. VAN MONDFRANS — BRIGHAM YOUNG UNIVERSITY
JAMES L. SCHOTT — USOE ADMINISTRATIVE INTERN
DENNEY G. FRENCH — RICHMOND SENIOR HIGH SCHOOL

Carroll's (1963) article describing a "Model for School Learning" notes that time is a major variable in learning and that several other crucial instructional variables can be defined in terms of it (eg. motivation equals the time a student is willing to spend on a task--perseverance). Other potentially important variables in instruction emphasized by other investigators are sequencing (cf. the chapters on organization and sequence in Anderson, Faust, Roderick, Cunningham, and Andre (ed.) 1969), group size, and homogeneity (cf. Yates, 1966; Ekstrom, 1961 or Harris, 1960). The importance of these variables, however, is being disregarded, as evidenced by the policies inflexibly fixing class-length periods (eg. 40-45 minutes every day for math or science, etc.) and group sizes. On the other hand, teachers have long argued that more flexibility in these variables would allow them to be more effective and as a result, block scheduling was developed to resolve problems in determining when, for how long, and in how large a group students should interact with specific instructional materials.

Now in its eighth year of operation in American secondary schools (Thomson, 1971), scheduling (block scheduling) has been adopted and/or adapted to increase instructional effectiveness. Although there are some

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problems, schools using block scheduling report many benefits which should accrue or are believed to have accrued, (cf. Polos, 1969; Wood, 1970; Stewart and Shank, 1971). Among the benefits ascribed to block scheduling are more individuality of instruction, more flexibility in allotting time to learn, and more professional teacher involvement in instructional programming including more preparation time and more flexibility in teaching techniques and group size. These "benefits," however, are only assumed to result in greater student achievement and more positive attitudes toward school-a review of the literature concerning block scheduling reveals little supportive data. Indeed, even the expository articles on block scheduling which extol its "virtues" point out that there are also problems. The purpose of this paper is to resolve whether the effects of block scheduling on student achievement and attitudes really are more advantageous.

Procedure

The block scheduling treatment involved three required courses on each of four grade levels--freshmen through senior in high school. Inter-disciplinary teaching teams were responsible for instruction. The basic schedule design showing grade, number of teachers and students, amount of time, and courses was as follows:

9th Grade (Religion, English, and Physical Science)	3 Teachers	90-110 Students	140 Minutes
10th Grade (Religion, English, and Biology)	3 Teachers	90-110 Students	140 Minutes
11th Grade (Religion, English, and U.S. History)	3 Teachers	90-110 Students	140 Minutes
12th Grade (Religion, English, and Govt./Economics)	3 Teachers	90-110 Students	140 Minutes

The use of the time allotted depended entirely upon the purposes, needs, and desires of the teaching teams. At times, the entire group of 90-110 students could meet for a lecture, film, or test. The length of the large group class meeting depended upon the instructional demands of the teacher team. Very often the students met in small groups of ten to twenty students with the various teachers for discussion sessions of varying lengths. Finally, within this same block of time, students could be released from class for independent study activities.

The traditional scheduling treatment involved each teacher with three classes of 30-35 students for 40 minutes each day.

Twelve teachers were selected to participate in the experiment, each teaching in a block scheduling format for one-half day and in a traditional format for the other half. Six units were taught by each teacher in their particular subject matter area, allowing sufficient time for differences in student achievement and attitude to emerge (if the treatments had different effects). Teachers prepared behavioral objectives, teacher objectives, and tests in advance which made lesson objectives and tests identical for both the block scheduling and the traditional treatments. In addition, careful monitoring ensured that they stayed the same across treatments.

Each team of three teachers met with two groups of students, a morning and an afternoon session. The groups of students who received the block scheduling treatment or the traditional treatment were chosen at random. The assignment of students to morning and afternoon groups was done during the previous summer by a computer concerned only with balancing the number of students in the various classes.

Part of the data for analysis was the scores on objective, teacher-made tests covering the material taught in the instructional units. Another part was the ratings filled out by students on their interest and attitudes toward learning. When the data were examined before analysis, few students had taken tests for the units on religion. This circumstance was ascribed to the religion instructors' laxness in holding students responsible for what they learn. Because it was impossible to determine if the few students who did take tests in religion were representative of the whole sample, it was decided not to analyze even the existing data. Virtually all Ss in English (over 99%) took tests, and there were scores available for over 99% of the Ss on the tests given in the other classes: freshmen-history, sophomores-biology, juniors-U.S. history, and seniors-economics/government. The data for the English classes and the "other" classes were analyzed together in a 2x2x4 factorial design with the main effects of treatment (block scheduling v.s. traditional scheduling), classes (English v.s. "other") and grade level (freshmen, sophomores, juniors and seniors).

Results

In the analysis of variance the main effect of treatment was significant ($f=4.55$, $p<.05$) with the overall mean for the traditional scheduling treatment (52.7) slightly higher than the overall mean for the block scheduling treatment (51.9). The three-way interaction of treatment by classes by grade level was also significant ($f=9.95$, $p<.001$). To aid interpretation, this interaction was graphed with the data for the English classes superimposed on the data for the "other" classes. These data are graphed in Figure 1. As can be seen on Figure 1, when the scores on the English tests are considered, the freshmen and sophomores have higher means in the traditional scheduling treatment, the mean

for the juniors is similar in both treatments, and the seniors have a higher mean in the block scheduling treatment. When the scores on the "other" tests are considered, the means for the freshmen and sophomores are similar in both treatments, the mean for the juniors is higher in the traditional scheduling treatment and, once again, the mean for the seniors is higher in the block scheduling treatment.

Since only two of 30 possible F-ratios were significant when the attitude and interest scores were analyzed, the overwhelming conclusion is that the two treatments did not differentially affect these variables.

Discussion and Conclusion

The findings of this study suggest several interesting questions concerning the effectiveness of block scheduling. Within the context of this study, time and group size flexibility resulted in improved performance or attitudes with seniors only. Three explanations are possible. First, the teachers involved may have had difficulty handling the added flexibility of the time and group size variables. As Stewart and Shank (1971) point out, when time, group size and use of facilities become flexible, .."Textbooks, workbooks, lectures, units, media presentation and assignments simply...(do not) adequately function as before (p. 538)." New roles and task definitions for teachers, including preparation in instructional designing seem vital to handling the new flexibility in the teaching environment.

Although a second possible explanation is that time and group size flexibility are important, this explanation seems unlikely. Many researchers and educators point to "time to learn" as an integral variable. Block scheduling should improve students chances to have sufficient "time to learn." However, even under block scheduling, many decisions concerning when to move on are made on a group basis

rather than in response to individual student performance. The degree of flexibility theoretically possible under block scheduling may not always be reflected in actual practice.

A third explanation for the failure of block scheduling to improve performance is that the relatively greater variety of conditions under which instruction occurs in the block scheduling treatment requires considerable maturity on the part of the learner. Freshmen, sophomores, and juniors did not have enough maturity to profit from the learning conditions under block scheduling, while the seniors' greater maturity may have resulted in their better performance. Several authors have demonstrated that block scheduling works better with "good" students and that "poorer" students often have more difficulty under this treatment than in a traditional program. (cf. Thomson, 1971). Perhaps the characteristics of self-control, self-directedness and self-motivation, all part of maturity, are critical.

That student attitudes toward learning, school, and each unit of instruction were similar in the two treatments was surprising. Most authors describing block scheduling programs name high student affect as one of the principle advantages. It may be that attitudes were not different because the block scheduling had not been in effect long enough for its advantages to become clear to the students. Perhaps our instrument was too gross a measure to notice differences. On the other hand in the absence of data to contradict our findings, it may be that the assertion is incorrect. No doubt some students like and benefit greatly from the changed conditions; however, their positive attitudes may be offset by the negative attitudes of those students who do more poorly under block scheduling.

Whichever explanation is correct, the salutary effects hoped for in changing from traditional scheduling to block scheduling did not occur except at the senior level. Certainly before large scale adoption of any innovation occurs, careful evaluation of the innovations consequences should be made.

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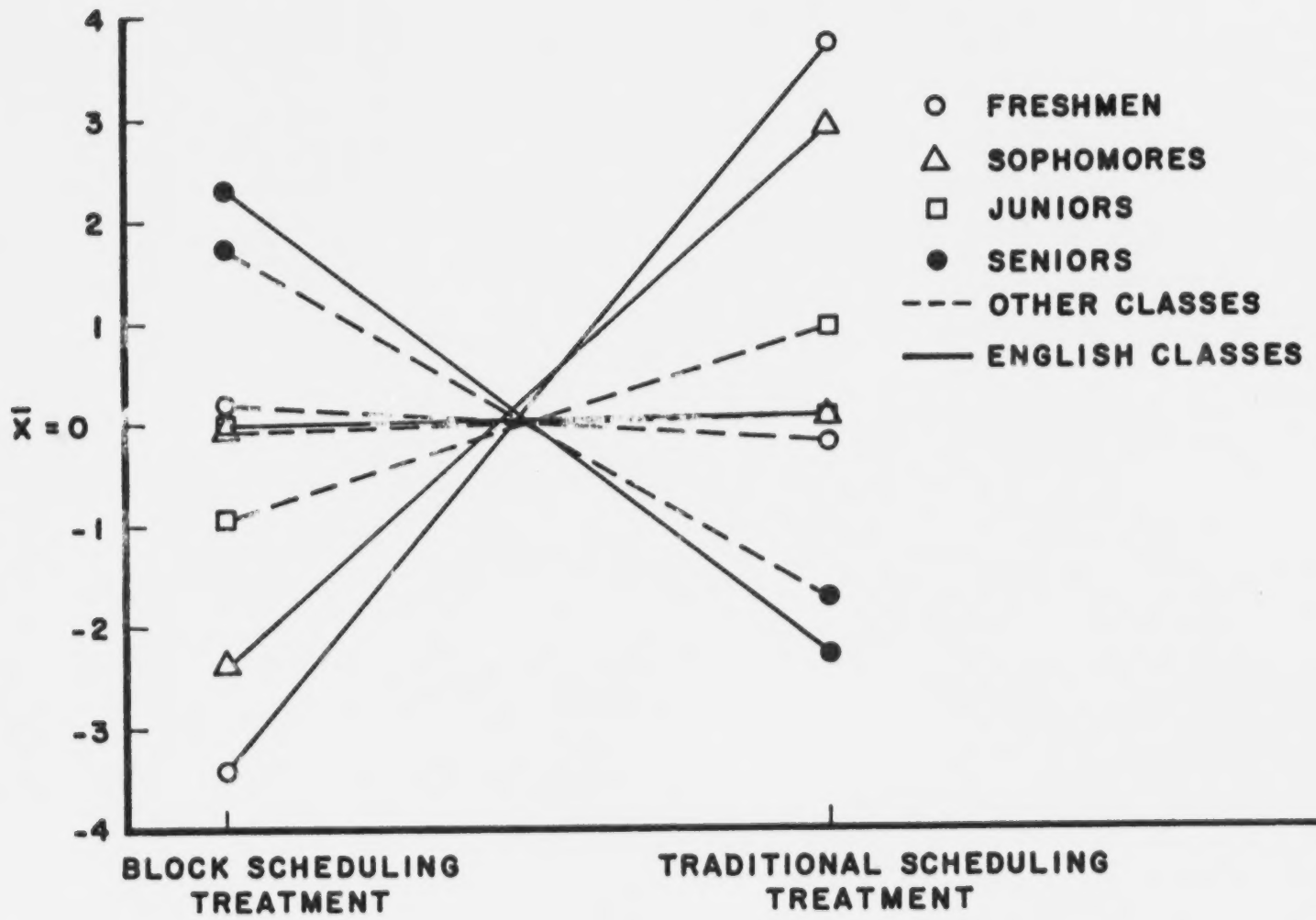
FIGURE CAPTIONS

Figure 1. Deviations from the overall mean score for both treatments within grade level and for each type of class.


4
3
2
1
$\bar{X} = 0$
-1
-2
-3
-4
FRESHMEN
SOPHOMORES
JUNIORS
SENIORS
OTHER CLASSES
ENGLISH CLASSES
BLOCK SCHEDULING TREATMENT
TRADITIONAL SCHEDULING TREATMENT